

Specifications for SWC #504 Winter Road Maintenance

A. Scope of Work

The purpose of this Invitation to Bid ("ITB") is to provide winter road maintenance materials to the State of Tennessee ("State") Agencies. The Contractor(s) shall provide goods or services required by this Contract to all Tennessee State Agencies and shall also make this Contract available to all Authorized Users, as defined in the Terms and Conditions. Contractor(s) agrees to extend this Contract to Authorized Users.

B. Definitions

- 1. CMA: Calcium Magnesium Acetate
- 2. OSHA: Occupational Safety and Health Administration, a federal agency that focuses on the safety and health of workers and additionally described in 29 CFR 1910.1
- 3. QPL: Qualified Products List is a list of qualified products and procedures researched, tested, and evaluated by TDOT's Division of Materials and Tests accessible at https://www.tn.gov/tdot/materials-and-tests/research---product-evaluation-and-qualified-products-list.html
- 4. SDS: Safety Data Sheets (formerly MSDS, Material Safety Data Sheets) as defined in the Hazard Communication Standard by OSHA in 29 CFR 1910.1200
- 5. TDOT: Tennessee Department of Transportation

C. General Requirements

- 1. Compliance with Laws and Regulations and General Requirements
 - a. Manufacturers of chemical products which are the subject of purchase contracts for the State of Tennessee shall list and maintain a material Safety Data Sheet (SDS) for such chemical products which shall be submitted at time of bid or available for viewing on the manufacturer's website. A site operated by or on behalf of the manufacturer or a relevant trade association is acceptable so long as the information is freely accessible to the public.

- b. Specifications or references to available specifications shall be sufficient to make the terms of such specifications binding on the Contractor. Respondents must submit for bid evaluation applicable cuts, sketches, descriptive literature, and technical specifications covering the product offered when applicable. Reference to literature submitted previously will not satisfy this requirement.
- 2. Contractor(s) awarded asphalt product(s) must provide the product(s) awarded through both delivery and pick-up options. For orders to be picked-up at the Contractor's plant location, the Authorized User shall be responsible for supplying equipment and labor to haul requested product to delivery point.

D. Liquid Calcium Chloride

- 1. All Liquid Calcium Chloride provided shall be a 32% solution of calcium chloride and water at 77° F.
- 2. Certification
 - a. Contractor shall furnish Authorized User at the time of delivery with certification of the following:
 - 1. Weight of liquid calcium chloride and temperature at time of weighing.
 - 2. Number of gallons loaded.
- 3. Delivery
 - a. Delivery shall be made when requested by the Authorized User ordering material.
 - 1. Deliveries shall be made Monday through Friday between the hours of 8:00 am and 4:00 pm, excluding holidays, unless authorized by the Authorized User.
 - 2. Deliveries shall be requested in tanker load minimums of approximately 4,300 gallons. Tanker shall not be required to make more than three (3) stops per delivery within any TDOT district.
- 4. Weight verification
 - a. The Contractor shall provide a means of accurately determining the specific gravity and temperature of the solution at the point of delivery.
 - 1. Authorized User reserves the right to have the tanker weighed loaded and weighed empty at time of delivery and at the expense of the Contractor.
 - 2. Authorized User shall have the right to reject any delivery should the Contractor fail to meet requirements of the contract, or if the material has crystalized.
- 5. Acceptable Brands
 - a. Liquidow, Sicalco, or equal. Note: Equal brands will need to be approved by TDOT Materials and Test Division prior to award.

E. De-Icer

1. Composition: a. Calcium magnesium acetate (CMA) hydrated CMA 96% minimum

b. Inert material 4% maximum

2. Particle Size: a. Sieve: 4 mm - 14 mm

b. % Passing: 90 min, 10 max

3. Particle Shape: a. Hard, angular, symmetrical

4. Specific Gravity: a. Minimum 1.2 (Liquids)5. Bulk Density: a. 40 lb/cubic foot (loose)

b. 44 lb/cubic foot (packed)

6. Product PH: a. pH, 8 to 10 in a 10% solution

7. Product attributes: a. Performance: Breaks and inhibits bonding between ice and road

surface.

b. High CMA Content: High heat of solution, low water content and high capacity for waters of hydration.

c. Low Corrosion: Does not corrode Zinc, Aluminum, concrete, or steel. Shall not harm bridges, road structures, roads, or vehicles. Contains no

chloride.

8. Packaging: a. Bag shall be a minimum of 1000 kg (one metric ton).

9. Minimum order: a. Authorized Users shall order in a minimum of 6 bags per shipment.

b. Can be applied with the same equipment used for road salt

10. Acceptable Brands: a. Cryotech CMA, Melt Snow CMA, or equal. Note: Equal brands will need to be approved by TDOT Materials and Test Division prior to award.

F. Liquid Calcium Chloride, Non-Corrosive De-Icer

- 1. Certification
 - a. Contractor shall furnish Authorized User at the time of delivery with certification as the following:
 - 1. Weight of liquid calcium chloride and temperature at time of weighing.
 - 2. Number of gallons loaded
- 2. Delivery
 - a. Delivery shall be made when requested by the Authorized User ordering material.
 - Deliveries shall be made Monday through Friday between the hours of 8:00 am and 4:00 pm, excluding holidays, unless authorized by the Authorized User.
 - 2. Deliveries shall be requested in tanker load minimums of approximately 4,300 gallons. Tanker shall not be required to make more than three (3) stops per delivery within any TDOT district.
- 3. Weight Verification
 - a. The Contractor shall provide a means of accurately determining the specific gravity and temperature of the solution at the point of delivery.
 - 1. Authorized User reserves the right to have the tanker weighed loaded and weighed empty at the time of delivery and at the expense of the Contractor.
 - 2. Authorized User shall have the right to reject any delivery should the Contractor fail to meet requirements of the contract or if the material has crystalized.
- 4. Acceptable Brands
 - a. Liquid Dow Armor, Sicalco Si-TN-03, or equal. Note: Equal brands will need to be approved by TDOT Materials and Test Division prior to award.

G. <u>De-Icer - Magnesium Chloride</u>

- 1. Aqueous solution containing carbohydrates, proteins, and other organic moieties derived from fermentation and distillation processes of agricultural products combined with magnesium chloride and other inorganic chlorides.
 - a. Physical:
 - 1. Density 1.27 to 1.29 grams per mil
 - 2. Weight per gallon (us): 10.6 to 10.75 lbs
 - 3. Total solids (105° Celsius) 53 to 56%
 - b. Chloride Content:
 - 1. Magnesium Chloride 12.5 14.5%
 - 2. Calcium Chloride 3.8 4.3%
 - 3. Sodium Chloride 0.1 0.4%
 - 4. Potassium Chloride 0.1 0.3%

2. Delivery

- a. Delivery shall be made when requested by the Authorized User ordering material.
 - 1. Deliveries shall be made Monday through Friday between the hours of 8:00 am and 4:00 pm, excluding holidays, unless authorized by the Authorized User.
 - 2. Deliveries shall be requested in tanker load minimums of approximately 4,300 gallons.
- 3. Weight verification
 - a. The Contractor shall provide a means of accurately determining the specific gravity and temperature of the solution at the point of delivery.
 - 1. Authorized Users reserve the right to have the tanker weighed loaded and weighed empty at the time of delivery and at the expense of the Contractor.
 - 2. Authorized Users shall have the right to reject any delivery should the Contractor fail to meet requirements of the contract or if the material has crystalized.
 - b. Acceptable brands/models: Magic Minus Zero, Ice B'Gone, or equal.

 Note: Equal brands will need to be approved by TDOT Materials and Tests Division prior to award.

H. High Performance Cold Patch Material

- 1. Description
 - a. This specification shall govern for an asphaltic concrete mixture for the repair and patching of small pavement areas in asphaltic concrete and Portland cement concrete in cool to cold weather applications. The patching material shall be listed on TDOT's Qualified Products List for patching materials, high performance cold patch. Acceptance of the material shall be by manufacturer's certification stating that the material furnished is identical to that which was originally approved and shown on TDOT's Qualified Products List. Please see QPL 13: Patching Materials Procedures for Testing Procedures.
- 2. Mixture properties
 - a. The mixture shall be designed so that it has good workability and can be placed at temperatures of 20 to 140 degrees Fahrenheit without the addition of heat. The mixture

shall have good adhesion to wet surfaces and be resistant to damage by water, salt and de-icing products. It shall consist primarily of crushed stone, cutback asphalt and additives. The mixture must be uniform and not require any mixing prior to use. It shall be capable of being removed from the container without significant adherence to the container. Application of the mix must be able to be accomplished by hand labor. Traffic must be able to travel over the mix with little to no compaction immediately after installation without pick-up of the mix by vehicle tires. The mixture shall cure and harden with continued vehicle use.

- 3. Each Respondent shall submit with their bid, certification that the material they bid is of the same formulation as that furnished for approval to be placed on the Qualified Products List. Any change in formulation shall require that a sample be submitted for re-evaluation.
- 4. Contractor(s) must provide product(s) in accordance with the QPL 13.A 13.001, as may be updated and revised. The current TDOT-approved QPL 13.A 13.001 is provided as Exhibit A.

I. <u>High Performance "Year-Round" Permanent Pavement Repair Material</u>

- 1. Description
 - a. This specification shall govern for an asphaltic concrete mixture for the repair and patching of small pavement areas in asphaltic concrete and Portland cement concrete in cool to cold weather applications. The patching material shall be listed on TDOT's Qualified Products List for patching materials, high performance cold patch. Acceptance of the material shall be by manufacturer's certification stating that the material furnished is identical to that which was originally approved and shown on TDOT's Qualified Products List. Please see QPL 13: Patching Materials Procedures for Testing Procedures.

2. Material Properties

- a. This material shall be a plant or pug mill mixed, high performance pavement patching material capable of storage in an uncovered outdoor stockpile for a maximum of 12 months. It shall be composed of TDOT Materials and Tests Division laboratory approved mineral aggregates and modified bituminous No VOC Liquid Blend capable of coating wet aggregates (up to 4% moisture) without stripping and shall have stripping resistance of retained coating of not less than 95%. The permanent asphalt repair shall be uniform, remain flexible and cohesive to -15°F, and be capable of retaining adhesive qualities in wet applications. The patching materials shall be able to repair asphalt, concrete, surface treated roads, and shall not require removal and replacement if the pavement is ever overlaid.
- b. Application Dates Required
 - 1. Year-Round high-performance pothole repair material
- c. Field Applications
 - 1. Material must be usable workable from -15° F to 105° F. Must work in water filled holes

3. Material Guarantee

a. Material must be guaranteed as permanent (until surrounding pavement area fails). Pavement Repair material, when used according to directions and applied to

deteriorated concrete or bituminous pavement surfaces, is guaranteed to adhere permanently to the repaired area (or until the surrounding pavement area fails). Contractor shall replace actual volumes of material used, at no charge, if, for any reason, patch material should ever ravel, release, or otherwise fail in any properly repaired area.

4. Environmental impact

a. The modified bituminous asphalt repair must have an independent test conducted by a certified laboratory as to toxicology results in Static Acute Bio Assay Procedures for Hazardous Materials which determines effect of run-off into waterways, lakes, ponds, and ground water. Results of analysis for the toxicity should indicate a 0% mortality rate of Daphnia magna at 100% effluent concentration. The repair material must be classified as non-hazardous and biologically non-toxic. No VOC Repair Material must conform to ASTM D402 requirements. Independent laboratory results must be provided to the State prior to award.

5. Materials

- a. Aggregate
 - The aggregate shall consist of 100% crushed stone or a laboratory approved equivalent under ASTM C-136. All aggregate shall be from approved sources; representative samples of both fine and coarse aggregate shall be from the plant site and laboratory tested. Sampling and testing methods shall be in accordance with accepted local practice.
- b. Gradation analysis shall comply with all local requirements. Recommended gradation analysis is as follows:
 - 1. SCREEN SIZES PERCENTAGE PASSING
 - a. 3/8" (9.5mm) 100 %
 - b. #4 (4.75mm) 20 85 %
 - c. #8 (2.36mm) 2 30 %
 - d. #16 (1.18mm) 0 10 %
 - e. #50 (0.75mm) 0 6 %
 - f. #200 0 2 %
- c. All aggregate percentages are based on the total weight of aggregate:
 - 1. ASTM C-88 Soundness Loss 12.0% Max.
 - 2. ASTM C-131 Los Angeles Abrasion 40.0% Max.
 - 3. ASTM C-117-200 -200 Sieve (by wash) 2.0% Max.
 - 4. ASTM C-127, 127 Absorption 1.0 2.0% Max.
 - 5. ASTM C-127, 128 Specific Gravity 2.55 2.75% Max
 - 6. ASTM C-122 Soft Aggregates 3.0% Max.
- d. Aggregate Acceptance
 - Aggregate compatibility approval must be obtained from the Quality Control Facility in Charleston, South Carolina prior to material mixing at any mixing plant.
- e. Bituminous Material The modified bituminous liquid blend shall be No VOC Liquid which meets the following requirements:
 - 1. ASTM D-1310 Flashpoint (TOC):

400°F (204°C) Min.

2. ASTM D-2170 Kinematic Viscosity at 140°F (60°C): 300-4000 Poises

3. ASTM D-95 Water: 0.2% Max.

4. ASTM D-402 Distillate Test (volume of original sample):

a. To 437°F (225°C) 0%

b. To 500°F (260°C) 0%

c. To 600°F (315°C) 0%

5. Residue from distillate at 680°F (360°C): 0.62%

f. Residue Tests

1. ASTM D-2171 ABS. Viscosity at 140°F (60°C): 125-425 Poises

ASTM D-5 Penetration:
 ASTM D-113 Ductility at 39°F (4°C) 0.4 in./Min:
 ASTM D-2042 Solubility in Trichloroethylene:
 99% Min.

g. No VOC Liquid Blend shall be shipped from authorized blending terminal locations. Liquid shall be completely blended at terminal under supervision of authorized Quality Control personnel. No additives, modifiers, or extra ingredients are to be introduced into the liquid blend at any time after shipment from terminal. A copy of bill of lading and material certification shall accompany every shipment. No VOC Liquid Blend shall be shipped in insulated tankers to maintain oil temperature during transportation.

6. Plant Mix

- a. The finished material shall consist of aggregates meeting material as specified in Section I.4.a I.4.d. Aggregate, and the bituminous liquid blend meeting material specified in section I.4.e. I.4.g. No VOC Bituminous Material as indicated in the proposed job mix formula. No VOC Bituminous Material shall be accepted at the Contractor's source and at the plant site on the basis of a Contractor material certification.
 - 1. The preferred mixing ratio shall be 4.0% to 6.0% liquid blend per finished metric ton (2,000 lbs.) of mixed material. Continuous on-site testing will determine exact final mixing ratio which shall be identified in the final job mix formula. All aggregate percentages are based on the total weight of the aggregate. The No VOC Liquid Blend content is based on the total weight of the mix.
 - 2. The job mix formula information shall provide:
 - a. Aggregate gradation band and aggregate type.
 - b. No VOC Liquid Blend amount and type including any additives used.
 - c. Temperature ranges for material preparation.
- 7. Manufacturing Preparation and Operation
 - a. Asphalt Plant Production
 - 1. The mixture shall be produced through a conventional hot asphalt plant only under the direct supervision of a qualified sales representative; finished product shall not exceed 180°F (82°C). The No VOC Liquid Blend shall not be heated above 200°F. The final mixture must be tested in accordance with onsite quality control requirements.
 - b. Pug Mill Production
 - 1. The mixture can be produced through a cold manufacturing process

(PUGMILL). The No VOC Liquid Blend shall be heated between 220°F (104°C) to 260°F (126°C). The No VOC Liquid Blend temperature is elevated to help with the adhesion process between the bituminous liquid and the aggregate. The finished mix shall not exceed 180°F when produced through the pugmill. The final mixture must be tested in accordance with the on-site quality control requirements.

c. Stockpile Inspection

1. Prior to production, the stockpile site shall be inspected for any contaminant such as dirt, sand, or debris that may affect the quality of the No VOC Repair Material. The stockpile area should be a hard surface (preferably paved with concrete) or a bituminous surface. No VOC Repair Material may be stockpiled up to 6 months in an uncovered, outdoor stockpile.

d. Specification Sampling

 A one-quart sample of the No VOC Liquid Blend shall be retained at the asphalt depot prior to shipping. On delivery of the tank truck, an additional one-quart sample will be taken by the sales representative and shall be retained by the customer/producer for a period of one year, or until the stockpile is depleted

e. Quality Control

1. On each load, a quality control report shall be prepared by the quality control technician. All phases of production of the plant operation and the material testing on each 150 tons of production shall be prepared and entered accordingly in each category. Site tests shall be completed which include Spot Test, Strip Resistance, Coating Observation and Roll Test.

f. Heating of Finished Product

1. No VOC Material should not be heated above 700°F (210°C) when utilizing a hot box.

g. Training of Installation Crews

- 1. Contractor shall make available a complete training program for all road crews to ensure correct patching methods, along with updates on this subject.
- 8. No VOC High Performance Pavement Repair, when applied according to our directions to deteriorated concrete or bituminous pavement surfaces, is guaranteed to adhere permanently to the repaired area for the life of the repair or until the surrounding pavement area fails. Contractor shall replace actual volumes of No VOC at no charge for any No VOC High Performance Pavement Repair that should ever ravel or release from a properly repaired area.
- 9. Contractor(s) must provide product(s) in accordance with the QPL 13.A 13.001, as may be updated and revised. The current TDOT-approved QPL 13.A 13.001 is provided as Exhibit A.

J. TDOT Special Instructions

- 1. TDOT is the main user of this contract. Special instructions relevant to TDOT's operation are detailed below:
- 2. Bulk high-performance cold patch delivered (QPL 13.A 13.001)

- a. Each region may place one (1) order for a minimum of 250 tons per year for delivery to the regional location and the respective districts. There will be multiple delivery points in amounts as determined by the regional office.
- b. Each district shall place orders with a 50-ton minimum on an as-needed basis.
- c. Deliveries shall be made in accordance with Terms and Conditions 7.4. Delivery / Pick-Up. The Contractor may make multiple deliveries to complete orders; however, the order shall be completed within fourteen (14) days after receiving order.
 - 1. Example: 50 tons delivered to regional location and 40 tons delivered to the 5 district offices within the region.
- d. Each region estimates placing an order in November or early December.
- 3. Bulk high-performance cold patch picked up at Contractor's plant (QPL 13.A 13.001)
 - a. Regions shall place orders in accordance with Terms and Conditions 7.4. Delivery / Pick-Up. The regions shall request a minimum of 50 tons per purchase order on an as needed basis.
- 4. High-performance cold patch containerized delivered and picked-up at Contractor's plant (QPL 13.A 13.001)
 - a. Regions shall place orders for pallets using the appropriate line items (e.g. 1 to 9 pallets, 10 pallets with additional increments of 10 pallets as appropriate) on an as needed basis. Delivery shall be made in accordance with Terms and Conditions 7.4. Delivery / Pick-Up.
 - b. Note: Cold patch containing cutback material shall not be purchased or used from April 1 through October 31 as per Tenn. Rules & Regs Chapter 1200-03-18-.32. All other cold patch material must be available year-round.
- 5. Bulk High Performance "Year-Round" Permanent Pavement Repair Material delivered and picked-up at Contractor's plant
 - Each district shall place orders with a 100-ton minimum on an as-needed basis.
 Delivery / pick-up shall be made in accordance with Terms and Conditions 7.4.
 Delivery / Pick-Up.
- 6. Containerized High Performance "Year-Round" Permanent Pavement Repair Material delivered and picked-up at Contractor's plant
 - a. Regions shall place orders for pallets on an as needed basis. Delivery / pick-up shall be made in accordance with Terms and Conditions 7.4. Delivery / Pick-Up.

K. TDOT Regional Locations

- 1. The following is a list of TDOT regional locations, district numbers and points of contact:
 - a. Dept of Transportation Region 1 Districts 17-19
 7345 region lane
 Knoxville, TN 37914
 Attn: Kristen Qualls, 865-594-2458
 - Dept of Transportation Region II Districts 27-29 4005 Cromwell Road Chattanooga, TN 37421

Attn: Adam Casteel, 423-510-1132

c. Dept of Transportation - Region III Districts 37-39

6601 Centennial Blvd.

Nashville, TN 37243-0360

Attn: Shay Deason, 615-350-4342

d. Dept of Transportation - Region IV Districts 47-49

300 Benchmark Place

Jackson, TN 38302-0429

Attn: Ross Sherwood, 731-935-0206

2. The following are TDOT's D.M.E. - Superintendents and Counties

a. **Region I**

1. Johnson City - District 17 North

Michael Dick

865-594-0750

Box 3518 CRS

Johnson City, TN 37602-3518

Counties: Carter, Johnson, Sullivan, Unicoi, Washington

2. Morristown - District 17 South

Michael Dick

865-594-0750

1825 State Street

Morristown, TN 37814

Counties: Greene, Hamblen, Hancock, Hawkins

3. Newport - District 18 East

Rachel Bentley

865-594-2408

Box 28

Newport, TN 37822

Counties: Cocke, Grainger, Jefferson, Sevier

4. Lafollette - District 19 North

Josh Metz

423-566-9631

2841 General Carl. W. Stiner Hwy. Lafollette, TN 37766

Counties: Campbell, Claiborne, Scott, Morgan

5. Knoxville - District 18 West

Rachel Bentley

865-594-2408

Box 58

Knoxville, TN 37901

Counties: Anderson, Knox, Union

6. Harriman - District 19 South

Josh Metz

423-566-9631

1951 South Roane

Harriman, TN 37748

Counties: Loudon, Monroe, Blount, Roane

b. Region II

7. Chattanooga - District 29

Keith Pruett

423-510-1218

P.O. Box 22368

Chattanooga, TN 37422-2368

Counties: Bradley, Hamilton, McMinn, Meigs, Polk

8. Dunlap - District 28 East

Robert Harvell

423-949-2128

P.O. Box 355 Dunlap, TN 37327

Counties: Bledsoe, Grundy, Marion, Sequatchie, Van Buren

9. Crossville - District 27 East

Bo Hoskins

931-528-4311

P.O. Box 1069 Crossville, TN 38557

Counties: Cumberland, Fentress, Overton, Pickett, Rhea

10. Cookeville - District 27 West

Bo Hoskins

931-528-4311

P.O. Box 2929 Cookeville, TN 38502

Counties: Clay, Dekalb, Jackson, Putnam, White

11. Tullahoma - District 28 West

Robert Harvell

423-949-2128

P.O. Box 98 Tullahoma, TN 37388

Counties: Cannon, Coffee, Franklin, Warren

c. Region III

12. Nashville - District 37 South Jay Wheeler

615-350-4452

6601 Centennial Blvd.

Nashville, TN 37209

Counties: Davidson, Williamson

13. Gallatin - District 37 North

Jay Wheeler

615-350-4452

1215 Hartsville Pk.

Gallatin, TN 37066

Counties: Macon, Smith, Sumner, Trousdale, Wilson

14. Clarksville - District 38 North

Derek Pryor

931-296-9611

1918 Wilma Rudolph Blvd.

Clarksville, TN 37040

Counties: Cheatham, Houston, Montgomery, Robertson, Stewart

15. Belfast - District 39 East

Ed McLain

931-270-5040

2099 Fayetteville Hwy.

Belfast, TN 37019

Counties: Bedford, Lincoln, Marshall, Moore, Rutherford

16. McEwen - District 38 South

Derek Pryor

931-296-9611

Rt. 3, Box 306B

McEwen, TN 37101

Counties: Dickson, Hickman, Humphreys, Maury

17. Lawrenceburg - District 39 West

Ed McLain

931-270-5040

1213 N. Locust

Lawrenceburg, TN 38464

Counties: Giles, Lawrence, Lewis, Wayne, Perry

d. Region IV

18. Mckenzie - District 47 East

John Ward

731-352-8585

P.O. Box 637

Mckenzie, TN 38201

Counties: Benton, Carroll, Decatur, Henry, Weakley

19. Newbern - District 47 West

John Ward

731-352-8585

Box 179

Newbern, TN 38059

Counties: Dyer, Gibson, Lake, Obion

20. Bethel Springs - District 48 South

Cody Roberts

731-935-0181

Box 2929

Bethel Springs, TN 38502

Counties: Chester, Hardeman, Hardin, McNairy

21. Jackson - District 48 North

Cody Roberts

731-935-0181

Box 429

Jackson, TN 38302-0429

Counties: Crockett, Haywood, Henderson, Madison

22. Arlington - District 49

Brandon Akins

901-537-1178

Box 126

Arlington, TN 38002

Counties: Lauderdale, Shelby, Tipton, Fayette